Welcome!

TRX is the reputable manufacturer and supplier of call recording systems in the Polish telecommunications market. With almost 20 years of experience our understanding of client needs allows us to create technical solutions superior to that proposed by the competition.

We offer a full range of equipment, products, and services that are certain to meet your needs and exceed your expectations. Our Development Team focuses on quality and reliability while emphasizing intuitive simplicity on newly introduced features. All our systems are modular in design, which simplifies upgrades, adjustments, and repairs while minimizing client down-time. Our equipment is compatible with most digital and analog PABX models and can be operated locally or via IP connection.

Our digital call recorders will empower you to increase the efficiency of dispatchers by analyzing past calls and decisions. We also provide call archives for corporate call centers, which can be used to assess customer needs, quality, efficiency, and as protection against fraud.

TRX offers solutions to a variety of municipal agencies, including but not limited to the Police and Fire Departments, private security agencies, broker agencies, the gas and electric power industries, and banks. Whenever preparing an offer we extensively study the client's needs so we can customize the system to their needs and facilitate future upgrades, while simultaneously working to minimize the cost to the client.

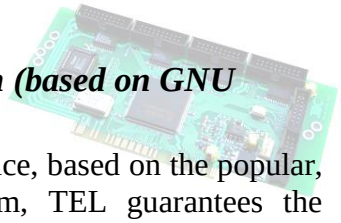
We are always grateful for questions and comments and are ready to collaborate on an individual basis to discuss solutions specific to your needs. We have already sold over 3700 systems in Poland. TRX recorders over six years are also being installed in Slovakia, the Czech Republic, Romania or Bosnia and Herzegovina.

We hope that you will find the solutions we propose one that will meet Your expectations.

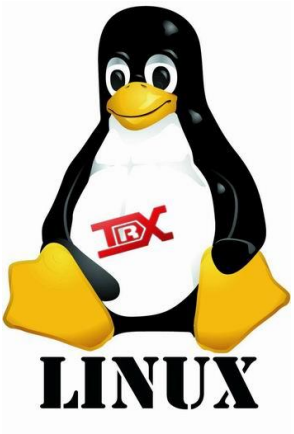
System detail.

General characteristic

The KSRC series digital call recording systems provided by TRX are independent devices controlled locally or over IP computer networks. The recorders have been designed to register audio and call related data from telephone and radiotelephone systems. TRX solutions are compatible with the majority of most popular PBX'es, such as: Alcatel OXE, Siemens HiPath, Ericsson, Avaya CM, DGT 3450, Platan, Slican, Panasonic, EADS (MATRA).
TRX recorders allow for recording calls from analog, ISDN (BRA/PRA) or digital lines, as well as VoIP based systems. For some radiotelephone models (Motorola GM series) we supply adapters of our design.



The TEL (TRX Embedded Linux) system (based on GNU Linux system).



Created solely for the call recording device, based on the popular, reliable and stable Linux operating system, TEL guarantees the seamlessness and reliability of the recorder's work.

The system is installed on the separate, integrated FLASH drive. The removable hard disk drive is utilized **solely as a recorded calls storage**. The hard drive failure does not impair the stability of the system. If a new disk is detected it is automatically set up for work with the recorder.

Backing recorded calls up on a remote computer's hard drive does not cause their deletion form the recorder's hard drive. There is no possibility of deleting recorded calls other than overwriting them by the recorder itself after using all of the disk's free space. The deletion option has been removed for security.

The data is stored using the unique file writing system implemented only in TRX Embedded Linux. This ensures the security of the recordings in case of unauthorized access.

Modular construction

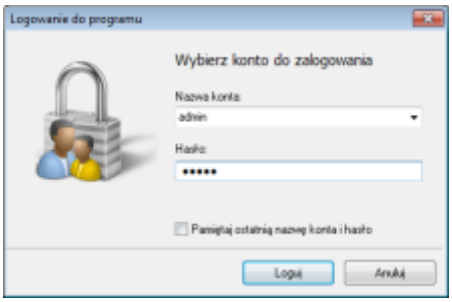
The system assembly begins with basic central unit (5 models will be presented in detail below) called main module. It consists of the casing, hardware components (base card, hard drive) and applicable software.

The phone line adapter cards are accessory devices, fixed inside the module, and they are selected according to the client's specific needs.

Security

The data transmission over LAN network is encrypted using the SSL protocol and TEL's encryption algorithms. The format the data is stored in is only recognized by the recorder, thus installing the hard drive in the PC computer does not facilitate unauthorized access to the data.

The system can be operated by many users, divided into two basic access security groups: Administrator and User. **Each one of them can have different set of access rights to particular functions of the recorder, such as monitoring, recording playback, archiving, configuration settings, etc.**



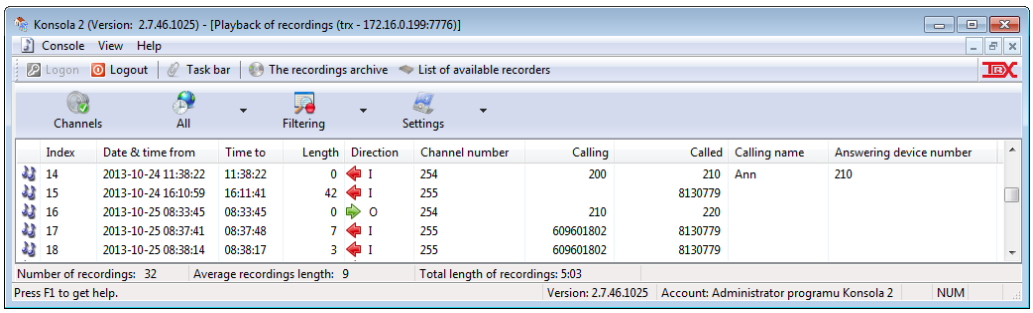
The users are authorized in the system in a username/password routine. The authorization system can also be integrated to Windows™ operating system or Radius® identification system (if the computer has Radius® protocol chip-card reader installed).

Each channel can have its own specific level of access. It allows diversifying the access level for many separate users.

Call recording

Call recording can commence according to specified criteria. The following options are available: **VOX** (signal level dependent activation), **triggering** (picking the receiver or other external signal), **digital signaling** (ISDN, VoIP), **network** (remotely enforcing recording commencement over LAN network). VOX and triggering criteria involve negative response time (2 sec). This means the data buffered during the last 2 seconds before the criteria are met are included in the recording. Triggering allows recording to be controlled manually (on request) or involving external devices like button, clock (recording during office-hours), photodetectors, movement sensors etc.

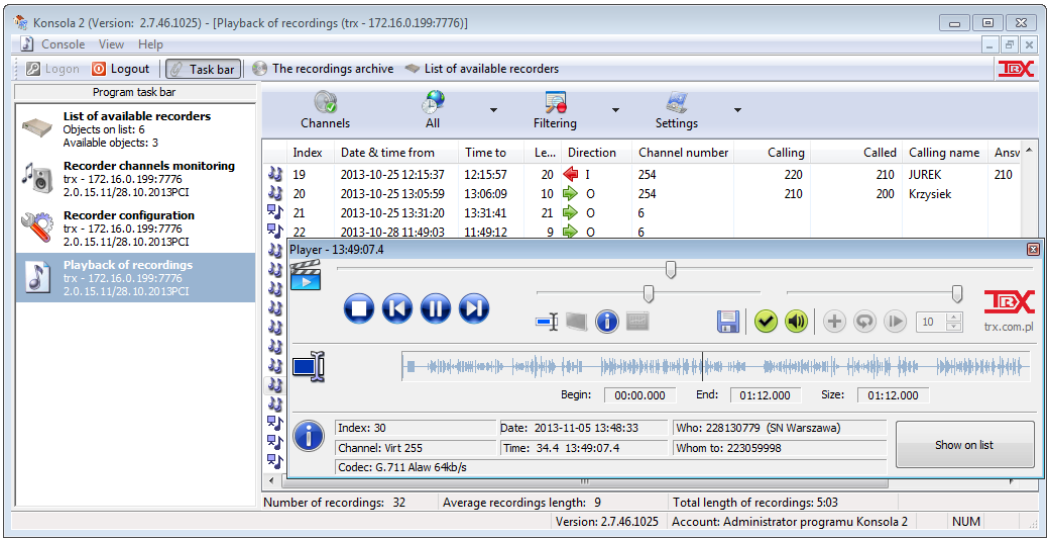
The calls recorded are time-stamped. In case of ISDN or VoIP based telephones the call direction (inward/outward) including numbers (dialing and dialed) is recognized and stored. The system is equipped with routines for telephone number decoding and presentation (DTMF, FSK) and selective radiotelephone call presentation: CCIR EAA, ZVEI1, ZVEI2, ZVEI3, PZVEI, EIA, EURO, CCITT, NATEL, VDEV, 5/TONE.


Konsola 2 (Version: 2.7.46.1025) - [Playback of recordings (trx - 172.16.0.199:7776)]
Console View Help
Logon Logout Task bar The recordings archive List of available recorders
Channels All Filtering Settings
Index Date & time from Time to Length Direction Channel number Calling Called Calling name Answering device number
14 2013-10-24 11:38:22 11:38:22 0 I 254 200 210 Ann 210
15 2013-10-24 16:10:59 16:11:41 42 I 255 8130779
16 2013-10-25 08:33:45 08:33:45 0 O 254 210 220
17 2013-10-25 08:37:41 08:37:48 7 I 255 609601802 8130779
18 2013-10-25 08:38:14 08:38:17 3 I 255 609601802 8130779
Number of recordings: 32
Average recordings length: 9
Total length of recordings: 5:03
Press F1 to get help.
Version: 2.7.46.1025
Account: Administrator programu Konsola 2
NUM

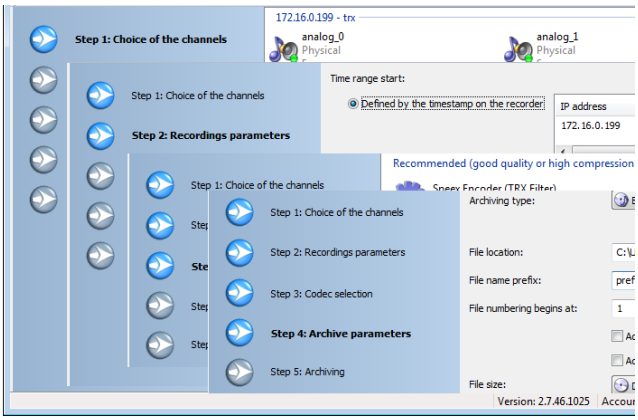
The line parameters such as recording-time signal level or recording stop delay can be supplied to the system. Additionally, the user gains the ability to monitor the line status.

The software

The experience and aptitude of our programmers allowed us to create highly reliable programs of intuitive interface and abundant in interesting features. The operator's workstation can be located independently to the recorder through use of LAN/WAN support. The existing computer infrastructure can be used to install our programs. The number of operators' desks is only limited by the number of computers and technical parameters of the network. Our software package is compatible with Microsoft® Windows™ (XP, Vista, 7, 8, Server 2003, Server 2008).



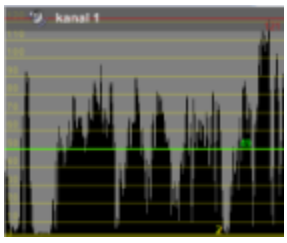
The main operating program is "*Konsola 2*." Its friendly user interface gives access to all (allowed by the user's security level) recorder's functions. It allows playback, channel monitoring, and archiving without interruption in recorder's work. It lets configure the system in the deepest detail. It also has plenty of convenient features, like searching (sorting) the calls by age, by channel, by telephone number, by comment or ***even*** by call duration.



Konsola 2 allows call's description editing – the user may add their own comment, update telephone numbers, adjust the security level or encrypt the recording. The calls can be quickly "skimmed" by playing only a few initial seconds of each call.

The data is archived on a remote computer where it is transferred over LAN/WAN network. The archive size can be freely modified (the maximum size, due to Windows file system limitation is 2 GB) and adjusted to fit the CD-R or DVD-R drive.

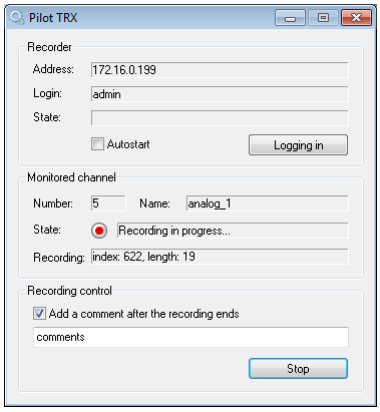
The .trx format archive retains the recording structure, i.e. the archive as an image of all or of a part of recorder's data – the channel binding is retained so that search can be performed as if directly on the recorder. The archived calls can be played on any computer with *Konsola 2* program installed.



The monitoring data can be presented graphically on screen. When developing our software, we focus on its functionality and simplicity of use always keeping the features up to your needs. Call playback, for example, can be adjusted to play only a specified portion of each call's beginning or continuous playback, which proceeds with all recordings from the list. Our equipment can even store the state of system telephone display during recording.

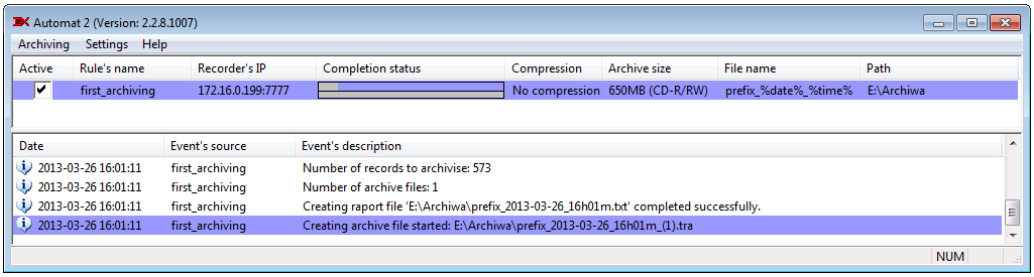
The daylight saving time adjustment is also solved and is carried out automatically. Moreover, the external recorder's clock can be synchronized with external sources (DCF77) via network (NTP protocol) and by master time signal broadcast.

The software tends to gain functionality and new features with every new version. This is the natural outcome of the system's dynamic development and ***market assessment***. For your benefit, we care that you are up to date with our new software versions. We are aware that the call recorders are to work seamlessly which is why we have designed the fast and seamless software update procedure. It can be performed remotely over the network using the "*Konsola 2*" program eliminating any need of interference with hardware.
Our complete understanding of your needs resulted in furnishing our software package with new programs.

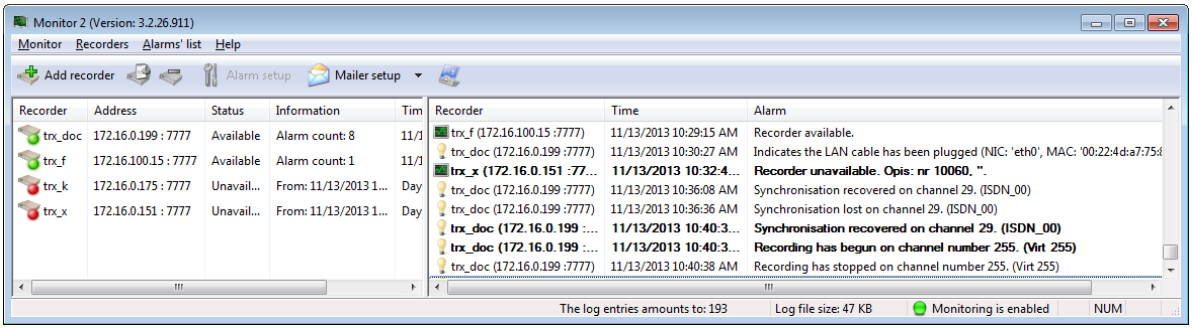


It is often the case that you do not require the whole call to be recorded but only its crucial fragment, as in conversation with the client. This special and useful feature is enabled in "Pilot" program which enables the recording from specific channel to be operated remotely by a computer. It allows you to start and stop recording at any moment during the call. The recorder enables assigning channel operation privileges to specific user. You can then sort the recordings by any criteria suitable for you: the call's subject, the answering person etc.

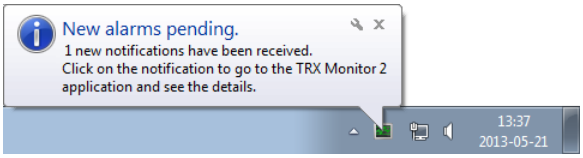
We are greatly concerned that our equipment and software should require minimum attendance and provide maximum convenience in use. The security of your data however is of the highest priority. The "Automat 2" and "Monitor 2" programs we offer consolidate both above requirements. The designation of "Automat 2" is periodical automatic recorder's data archiving. By properly defining the recording rules you ensure that no call will be overwritten by new one and irrevocably lost. The program's features comprise defining the archive size, periodicity and timing of archiving (eg. 8 PM on every Friday).


Automat 2 (Version: 2.2.8.1007)
Archiving Settings Help
Active Rule's name Recorder's IP Completion status Compression Archive size File name Path
first_archiving 172.16.0.199:7777 No compression 650MB (CD-R/RW) prefix_%date%_%time% E:\Archiwa
Date Event's source Event's description
2013-03-26 16:01:11 first_archiving Number of records to archivise: 573
2013-03-26 16:01:11 first_archiving Number of archive files: 1
2013-03-26 16:01:11 first_archiving Creating raport file 'E:\Archiwa\prefix_2013-03-26_16h01m.txt' completed successfully.
2013-03-26 16:01:11 first_archiving Creating archive file started: E:\Archiwa\prefix_2013-03-26_16h01m_(1).tra
NUM

„*Monitor 2*" is a utility that facilitates working with a set of recorders. It monitors the state of equipment giving the operator a better control over the equipment and enabling to quickly notice and react to any hardware or network failure.


Monitor 2 (Version: 3.2.26.911)
Monitor Recorders Alarms' list Help
Add recorder Alarm setup Mailer setup
Recorder Address Status Information Tim
trx_doc 172.16.0.199 : 7777 Available Alarm count: 8 11/1
trx_f 172.16.100.15 : 7777 Available Alarm count: 1 11/1
trx_k 172.16.0.175 : 7777 Unavail... From: 11/13/2013 1... Day
trx_x 172.16.0.151 : 7777 Unavail... From: 11/13/2013 1... Day
Recorder Time Alarm
trx_f (172.16.100.15 :7777) 11/13/2013 10:29:15 AM Recorder available.
trx_doc (172.16.0.199 :7777) 11/13/2013 10:30:27 AM Indicates the LAN cable has been plugged (NIC: 'eth0', MAC: '00:22:4d:a7:75:
trx_x (172.16.0.151 :77... 11/13/2013 10:32:4... Recorder unavailable. Opis: nr 10060, ".
trx_doc (172.16.0.199 :7777) 11/13/2013 10:36:08 AM Synchronisation recovered on channel 29. (ISDN_00)
trx_doc (172.16.0.199 :7777) 11/13/2013 10:36:36 AM Synchronisation lost on channel 29. (ISDN_00)
trx_doc (172.16.0.199 :... 11/13/2013 10:40:3... Synchronisation recovered on channel 29. (ISDN_00)
trx_doc (172.16.0.199 :... 11/13/2013 10:40:3... Recording has begun on channel number 255. (Virt 255)
trx_doc (172.16.0.199 :7777) 11/13/2013 10:40:38 AM Recording has stopped on channel number 255. (Virt 255)
The log entries amounts to: 193
Log file size: 47 KB
Monitoring is enabled
NUM

Should any problem arise, the program notifies the operator with a notification window and a sound signal. The auditing, as supported by "*Monitor 2*," increases security and minimizes the delay in case of failure or malfunction. Because "*Monitor 2*" can watch multiple recorders, it is possible to confine whole control center to one workstation which in turn allows you to use the existing control centers.


New alarms pending.
1 new notifications have been received.
Click on the notification to go to the TRX Monitor 2 application and see the details.
13:37
2013-05-21

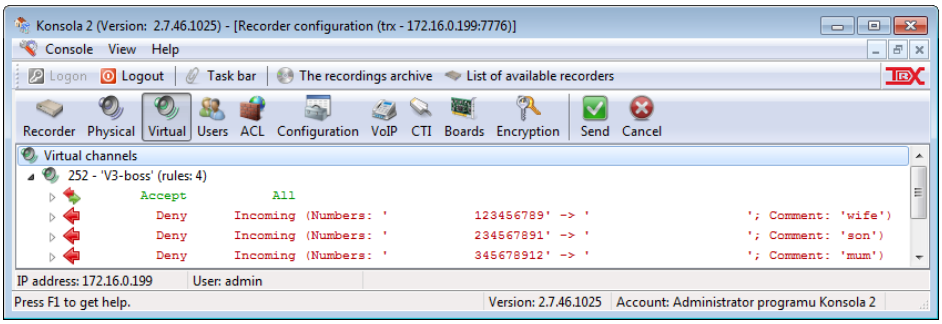
Your satisfaction is our primary aim. We are always working on improving convenience and intuitive simplicity of our software. The number and variety of its functions growing daily we offer the training in applications and equipment to clear up any arising doubts and increase your familiarity with our system's features. We can also suggest the specific adjustments to configuration so that it meets your requirements.

Virtual channels [1]

When you purchase the call recording system, it is natural that you expect only the required calls to be recorded. Upon closer study of the available equipment it often occurs that it is not the case. The TRX developers put their minds to improve on this issue. We have created **virtual channels**, a system of filtering and sorting the recorded calls.

Virtual channel can be operated just like an ordinary physical channel (without monitoring), eg. you can assign user access rights, use as an archive source and play recorded calls. The possibility to restrict calls to be recorded is its unique and most important feature. To ensure that only the calls you need, will be recorded you can set a variety of parameters like area code, source and target phone numbers, to mention just a few. Each virtual channel has a set of rules according to which the recording is or is not performed. The physical channels the calls are to be recorded from can also be chosen.

Let us study an example application. We assume that the Boss wants all incoming calls to be recorded, except those from his family who use mobile telephones. The set of rules required for this solution is presented below. All Boss's calls will be assigned to "V3 – boss" virtual channel".


Konsola 2 (Version: 2.7.46.1025) - [Recorder configuration (trx - 172.16.0.199:7776)]
Console View Help
Logon Logout Task bar The recordings archive List of available recorders
Recorder Physical Virtual Users ACL Configuration VoIP CTI Boards Encryption Send Cancel
Virtual channels
252 - 'V3-boss' (rules: 4)
Accept All
Deny Incoming (Numbers: ' 123456789' -> ' '; Comment: 'wife')
Deny Incoming (Numbers: ' 234567891' -> ' '; Comment: 'son')
Deny Incoming (Numbers: ' 345678912' -> ' '; Comment: 'mum')
IP address: 172.16.0.199 User: admin
Press F1 to get help. Version: 2.7.46.1025 Account: Administrator programu Konsola 2

That is only one basic example of this simple mechanism that greatly simplifies call recording organization. The other examples are:

- assigning single channel for a specific caller, even if the latter uses many phone numbers;
- dividing workers into logical groups, depending on the ongoing projects, their home departments, etc.;
- call zoning – by the area or country code.

[1] Virtual channels are available only in case of ISDN lines (30B+D, 2B+D) or VoIP calls are supplied.

The virtual channels allow you detailed employee control, let you record only vital calls, and aid you in keeping and improving your company's organization.

Hardware

Available modules

We offer five types of modules which differ from each other in size, in the maximum number of line interface card sockets (slots). Their common asset is the ability to be operated via network. Everyone is equipped with 100/1000 Mbps Ethernet adapter.

Common technical properties of the modules	
Supply	230 V~ +/- 20%
Power consumption	40 … 120 W
Input level for analogue sockets:	50mV – 2V AGC implemented
Display	LCD, monochrome, 4 line x 20characters
Operation	**local**: 6 buttons, access key, speaker for monitoring and listening to the recorded calls, **remote**: LAN/WAN network
Hard disk	500 GB or greater
Storage volume	15 000 h. (for 500 GB)

Type of basic module	Number of sockets	Dimensions (W – H – D)	Option, comments
KSRC 308/316	2 - 8 / 2 - 16	400 x 115 x 380 (mm)	-
KSRC 2U	2 – 24	19” 2U	- optional two discs in the mirror option in the "HotSwap" rack
KSRC 332	2 – 32	19” 3U/4U	- optional two discs in the mirror option in the "HotSwap" rack - optional duplication of the power source recorder
KSRC 5128	2 – 128	19” 3U/4U	- two discs in the mirror option in the "HotSwap" rack, - duplication of the power source recorder, - operation with extension module shelf

KSRC 332, KSRC 512 and KSRC 2U models can be equipped with two hard drives for mirroring (a RAID 1 array that uses the second drive as a mirror image of the primary drive). This protects you against data loss in case of drive failure and lets you replace the damaged drive without turning the recorder off. Another security feature is the ability of the recorder to utilize two **independent** power sources. The reliability of the recorder is thus greatly improved.

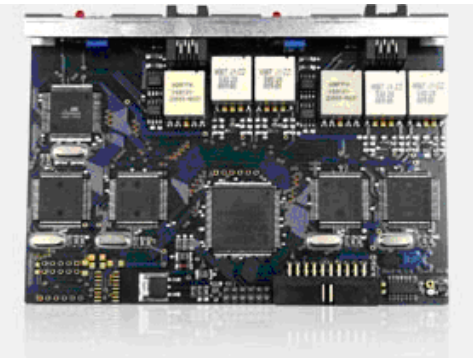
Available adapters

The common characteristic of all adapters we manufacture is the application of Xilinx® FPGA programmable chips and RJ-12 sockets as source signal connectors. With these we can connect our devices to the majority of modern telecommunication systems manufactured by the world's most formidable companies.

DSP analogue adapter

Analog line adapter supports analog signal sources such as telephone line, radiotelephone or microphone. DSP allows the analysis of incoming and outgoing calls numbers.

2B+D (BRA, S0) ISDN line adapter



2B+D (BRA, S0) ISDN line adapter. Each socket supports two voice channels.
Two versions are available:

- single socket (1 line – 2 channels),
- two sockets (2 lines – 4 channels).

The card is conducting analysis of numbers of incoming and outgoing calls.

Analogue - digital ISDN 2B+D (BRA, S0) line adapter

You can connect two analog phone lines and one ISDN line, which means that the card is able to record from two channels of analog and two channels of an ISDN line talkative. For ISDN channels analysis is numbers.

ISDN 30B+D (PRA, E1, G703, DSS1/MFC R2) adapter

ISDN 30B+D digital trunk adapter (PRA, E1, G703 protocol, DSS1 or MFC R2 signaling). The full board consists of 30 voice channels and two data channels (control). This adapter connects the recorder directly to the digital PABX.
There are two versions of this card:
1) full - allows to record 30 voice channels,
2) half - allows to record the first 15 voice channels.

Digital board

Support one proprietary digital protocol per one board. Working with digital lines the most popular manufacturers: Alcatel, Panasonic, Siemens, Ericsson, Avaya, DGT, EADS(MATRA), Lucent Technologies, Slican.

All of them come in 4-socket and 2-socket versions. This adapter allows you to analyze of call directions (incoming/outgoing), "*Calling"* and "*Called"* party numbers, the contents of the display system phones is also being recorded. Cards for individual systems can be configured in a wide range. There is a possibility to customize the card software to specific customer requirements.

Configuration examples

Sample 1

You have 4 radiotelephones, two analog lines (2 telephones) and 4 ISDN telephones. In your case the recording system will comprise:

- KSRC 316 as a base module;
- 2 channels analog line adapter (analog phones),
- 4 channels analog line adapter (radiotelephones),
- 2B+D ISDN line adapter (ISDN telephones).

This configuration allows future upgrade with one more 2- or 4-channels adapter as there is one socket left in the base module. In case of KSRC-332 module - 5 sockets would be left free and could be furnished with 5 pieces of 4-channels adapters giving additional analog channels.

Sample 2

A company has a digital PABX with 30B+D trunk connected. In this case we suggest a simple and inexpensive solution:

- KSRC 332 base module,
- 30B+D board adapter.

This configuration precludes connecting additional adapters, because 30B+D adapter utilizes all available slots on recorder's motherboard.

Sample 3

A call center uses 16 digital (system) phones. There are also 4 ISDN telephones and two analog lines to record calls from. We suggest the following configuration as an optimum.

- KSRC 2U base module,
- 4 pieces of 4 channels system line adapters (16 system phones),
- 4 channels analog line adapter
  (two analog lines, with upgrade margin for 2 additional lines);
- 4 channels 2B+D ISND adapter.

The module is equipped with 6 pieces of adapters – it was reached maximum usage recorder's resources.

Thank you for acquainting with our offer.

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